

Claims

1.

A closure having child-resistant and non-child-resistant modes of operation, which includes:

a plastic outer shell having a base wall, a peripheral skirt with a central axis, a circumferential array of lugs on an undersurface of said base wall, and a pair of axially spaced internal beads on the skirt spaced from said base wall, the internal bead further from said base wall being circumferentially continuous and having an internal diameter that is less than the internal bead nearer to said base wall, and

a plastic inner shell having a base wall, a peripheral skirt with a central axis, a circumferential array of lugs on an outer surface of said base wall, at least one internal thread on said skirt, and an external bead on said skirt remote from said base wall,

said external bead on said inner shell skirt having at least a portion that is circumferentially continuous and being sized for receipt by snap fit between said internal beads on said outer shell skirt in a non-child-resistant mode of operation in which rotation of said outer shell is imparted through said beads to said inner shell, said internal diameter of said internal bead further from said outer shell base wall being such with respect to said circumferentially continuous portion of said external bead on said inner shell skirt to retard removal of said inner shell from within said outer shell,

said external bead on said inner shell skirt being disposed between said internal bead of lesser diameter and said base wall of said outer shell in a child-resistant mode of operation such that rotation of said outer shell is imparted to said inner shell by engagement of said lugs on said base walls.

2.

1 The closure set forth in claim 1 wherein said base wall of said outer shell has a
2 central opening, and said base wall of said inner shell has a projection that extends into said
3 opening in said child-resistant mode of operation.

3.

1 The closure set forth in claim 1 wherein said outer shell includes ribs extending
2 between said internal beads, and said inner shell includes ribs on said external bead for
3 engagement with said ribs on said outer shell in said non-child-resistant mode of operation.

4.

1 The closure set forth in claim 1 wherein said internal bead on said outer shell
2 nearer to said base wall is circumferentially segmented, and said outer bead on said inner shell
3 has legs that extend axially into gaps in said segmented bead in said non-child-resistant mode of
4 operation.

5.

1 The closure set forth in claim 1 wherein said lugs on said base wall of said inner
2 shell are C-shaped as viewed from an axial direction, having clockwise facing legs with
3 angulated cam surfaces and counterclockwise facing legs with circumferentially facing abutment
4 surfaces.

6.

1 A closure that includes:

2 an outer plastic shell having an annular base wall, a skirt with a central axis
3 extending from an outer peripheral edge of said base wall, a circumferential array of lugs on an
4 underside of said base wall, a pair of axially spaced internal beads on said skirt spaced from said
5 base wall, and an opening defined by an inner peripheral edge of said base wall,

6 an inner plastic shell having an annular base wall, a skirt with a central axis
7 extending from an outer peripheral edge of said base wall, at least one internal thread on said
8 skirt of said inner shell, a circumferential array of lugs on an outer surface of said base wall, a
9 circumferential bead on an outer surface of said skirt adjacent to an edge of said skirt remote
10 from said base wall, and a dome extending from an inner peripheral edge of said base wall
11 coaxially and oppositely from said skirt,

12 said inner shell being positionable within said outer shell in a non-child-resistant
13 first position with said bead on said skirt of said inner shell captured between said beads on said
14 skirt of said outer shell and said outer shell rotatably coupled to said inner shell so that said at
15 least one internal thread on said skirt of said inner shell can be threaded onto and off of a
16 container by rotation of said outer skirt,

17 said inner shell being positionable within said outer shell in a child-resistant
18 second position with said dome extending into said opening, and with said bead on said inner
19 shell skirt spaced from said beads on said outer shell skirt such that rotation of said outer shell
20 is imparted to said inner shell by engagement of said lugs on said base walls.

7.

1 The closure set forth in claim 6 wherein said outer shell includes ribs extending
2 between said internal beads, and said inner shell includes ribs on said external bead for
3 engagement with said ribs on said outer shell in said non-child-resistant mode of operation.

8.

1 The closure set forth in claim 6 wherein said internal bead on said outer shell
2 nearer to said base wall is circumferentially segmented, and said outer bead on said inner shell
3 has teeth that extend axially into gaps in said segmented bead in said non-child-resistant mode
4 of operation.

9.

1 The closure set forth in claim 6 wherein said lugs on said base wall of said inner
2 shell are C-shaped as viewed from an axial direction, having clockwise facing legs with
3 angulated cam surfaces and counterclockwise facing legs with circumferentially facing abutment
4 surfaces.

10.

1 The closure set forth in claim 6 wherein the internal bead further from said base
2 wall of said outer shell has a lesser internal diameter than the internal bead closer to said base
3 wall of said outer shell to retard removal of said inner shell from within said outer shell.